

## 2.6 Sequences

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Find the pattern. Write the next 3 terms.**

1.  $\frac{1}{3}, \frac{1}{2}, \frac{3}{5}, \frac{2}{3}, \frac{5}{7}, \dots$

2.  $1, \frac{1}{4}, \frac{1}{7}, \frac{1}{10}, \frac{1}{13}, \dots$

**Determine if the following tables are linear or exponential. Explain what makes it linear or exponential.**

3.

$x$	$y$
3	11
4	31
5	51
6	71
7	91

4.

$x$	$y$
2	3
3	-15
4	75
5	-375
6	1875

5.

$x$	$y$
0	-3
1	2
2	$-\frac{4}{3}$
3	$\frac{8}{9}$
4	$-\frac{16}{27}$

6.

$x$	$y$
1	-26
2	-34
3	-42
4	-50
5	-58

**Find the first 6 terms and the 100<sup>th</sup> term of the explicitly-defined sequence. Show work!**

7.  $u_n = \frac{n+1}{n}$

8.  $d_n = n^2 - 5n$

**Find the first 5 terms of the recursively-defined sequence. Show work!**

9.  $a_1 = 8$  and  $a_n = a_{n-1} - 4$ , for  $n \geq 2$

10.  $a_1 = -6$  and  $a_n = a_{n-1} + 5$ , for  $n \geq 2$

11.  $b_1 = 2$  and  $b_{k+1} = 3b_k$ , for  $k \geq 1$

12.  $b_1 = 10$  and  $b_{k+1} = -5b_k$ , for  $k \geq 1$

13.  $c_1 = 2$ ,  $c_2 = -1$ , and  $c_{k+2} = c_k + c_{k+1}$ , for  $k \geq 1$

**The sequences are arithmetic. Find a) the common difference, b) the tenth term, c) a recursive rule for the  $n$ th term, and d) an explicit rule for the  $n$ th term. Show work!**

14. 6, 10, 14, 18, ...

15. -4, 1, 6, 11, ...

16. -5, -2, 1, 4, ...

17. -7, 4, 15, 26, ...

**The sequences are geometric. Find a) the common ratio, b) the eighth term, c) a recursive rule for the  $n$ th term, and d) an explicit rule for the  $n$ th term. Show work!**

18. 2, 6, 18, 54, ...

19. 10, 5, 2.5, 1.25, ...

20. 1, -2, 4, -8, 16, ...

21. -2, 2, -2, 2, ...

22. The fourth and seventh terms of an arithmetic sequence are -8 and 4, respectively. Find the first term and a recursive rule for the  $n$ th term. Show work!

23. The second and eighth terms of a geometric sequence are 3 and 192, respectively. Find the first term, common ratio, and an explicit rule for the  $n$ th term.

## Review Exercises

Solve the equation algebraically. State the restrictions and identify any extraneous solutions. Show work!

24.  $x+5=\frac{14}{x}$

25.  $2-\frac{1}{x+1}=\frac{1}{x^2+x}$

26.  $3(x-2)^{\frac{3}{4}}=24$

27.  $3\sqrt{x}+3=15$